CASA-CQUEST Team Contributions to California Carbon Accounting and Forest Ecosystem Partnership

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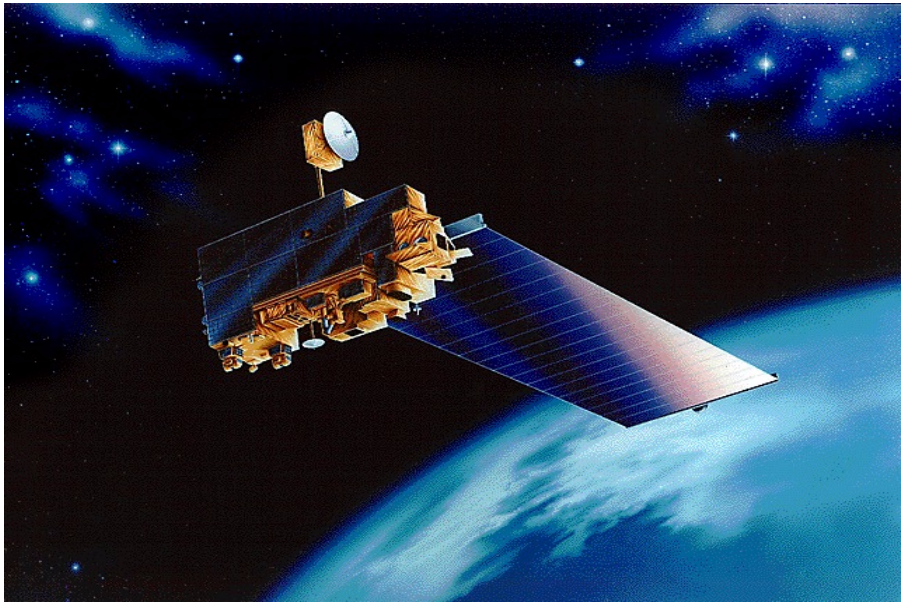

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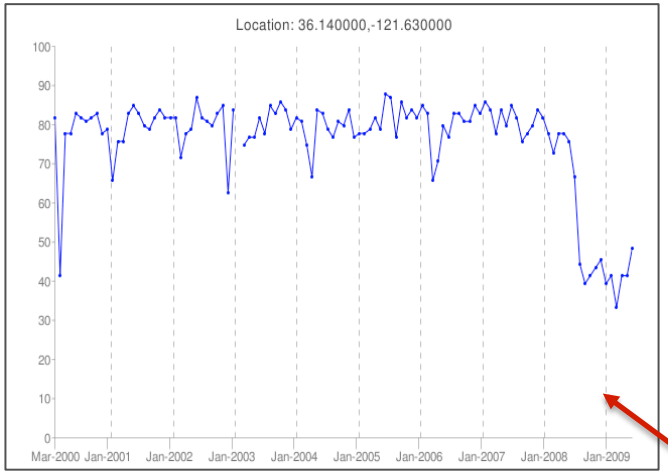
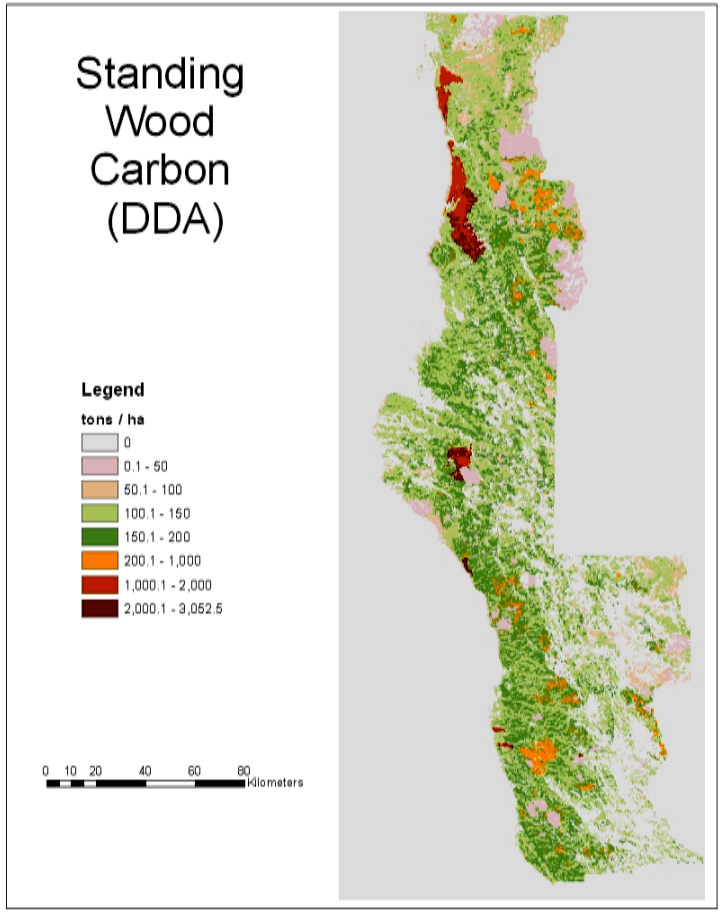
The carbon budget of California

Christopher Potter *

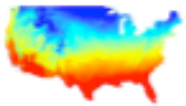
NASA Ames Research Center, Mail Stop 242-4, Moffett Field, CA 94035, USA





NASA / NGA
SRTM
Elevation

NASA MODIS
Products



VEMAP & Daymet (UMT)
Climate data

Inputs include continental-scale land cover, NDVI, FPAR, elevation, soils, and climate data …

CASA CQUEST – A Decision Support System for Carbon Accounting

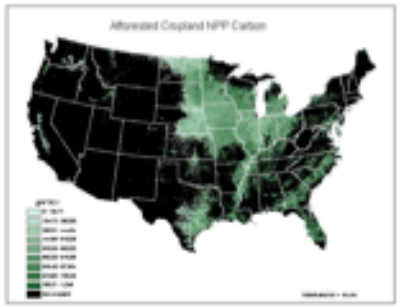
User Defined Profile
Region of Interest
Time Frame
Biophysical
Management
Climate Scenario

Leaf Biomass

Cropland NPP

Outputs: landscape-to continental scale predictive maps of above and below ground distributions of sequestered carbon for different climate scenarios

Carbon Sequestration Predictions



Cropland
Afforestation
Prediction

USFS Forest
Inventory and
Analysis Data

National
Resource
Inventory

Multi-scale Validation Information

Ames Research Center

Central Coast Fog Water Deposition and Satellite Mapping

USFS Partnership

Woodland and Shrubland (Fuel) Biomass Mapping

Ames Research Center

USFS Partnership

Patterns of Aboveground Biomass Regeneration in Post-Fire Coastal Scrub Communities

Shuang Li
NASA Ames Research Center,
Moffett Field, California 94035 and
Henan University, College of Environment and Planning,
Kaifeng, Henan 475004, China

GIScience & Remote Sensing, 2012, **49**, No. 2, p. 182–201.

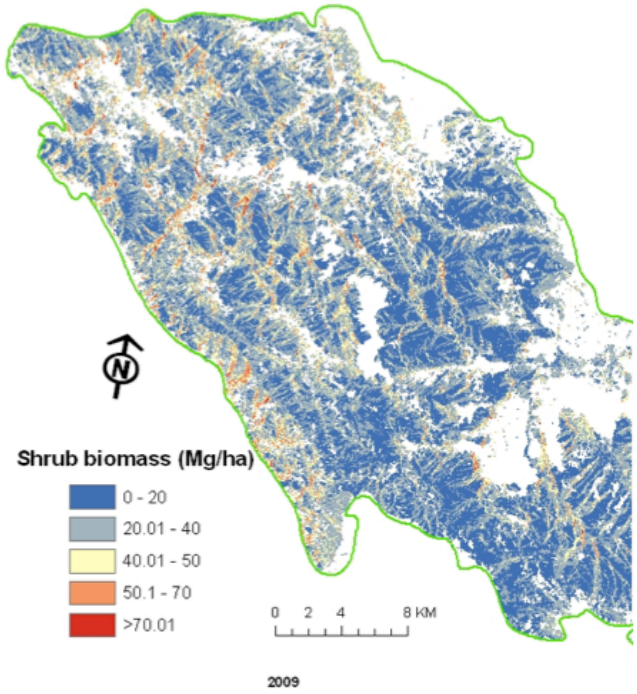


Fig. 7 Shrub AGB from FBD HV July, 2009

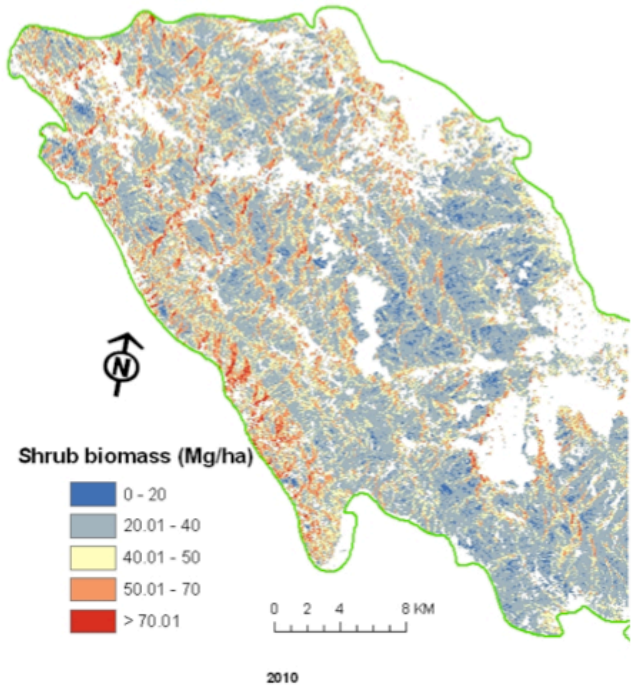


Fig. 8 Shrub AGB from FBD HV June, 2010

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Sierra Forest Biomass Mapping with Radar Remote Sensing

NPS Partnership

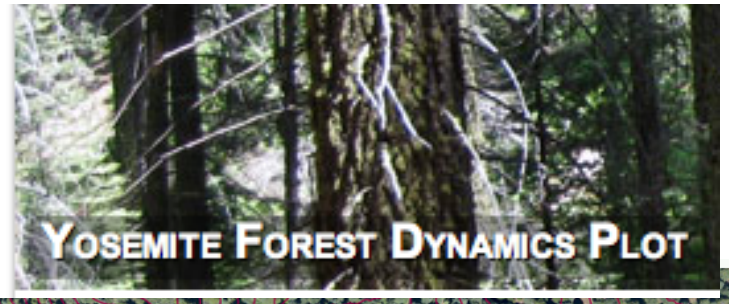
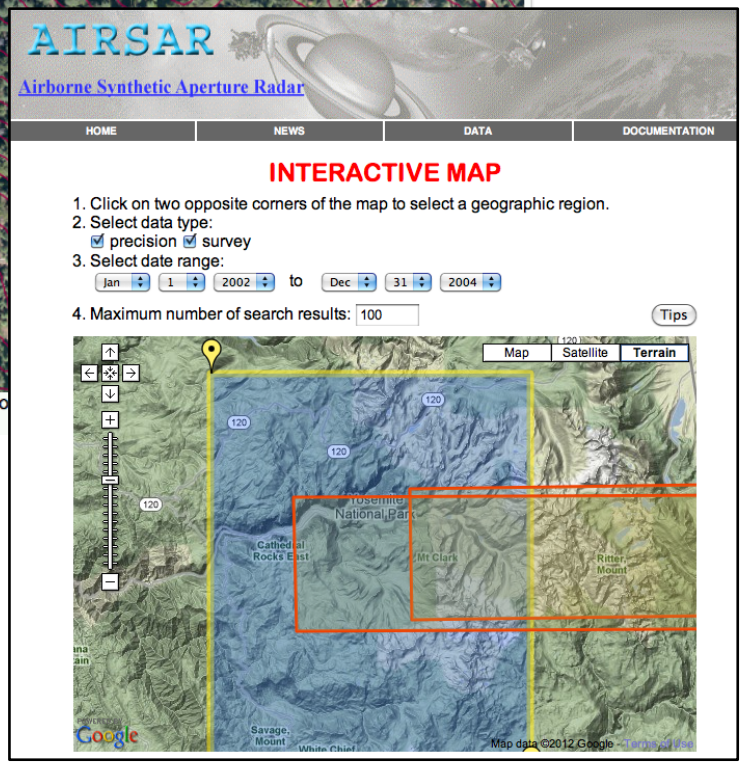
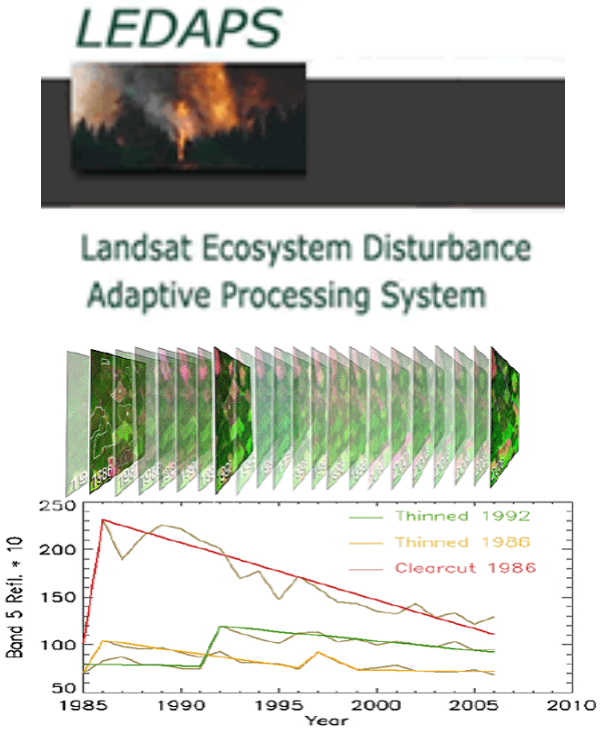


Figure 2. Orthophoto of the Yosemite Forest Dynamics Plot. This 15 cm resolution orthophoto
contours superimposed).



California Forest Carbon Project
Landsat-based Disturbance and Recovery Mapping

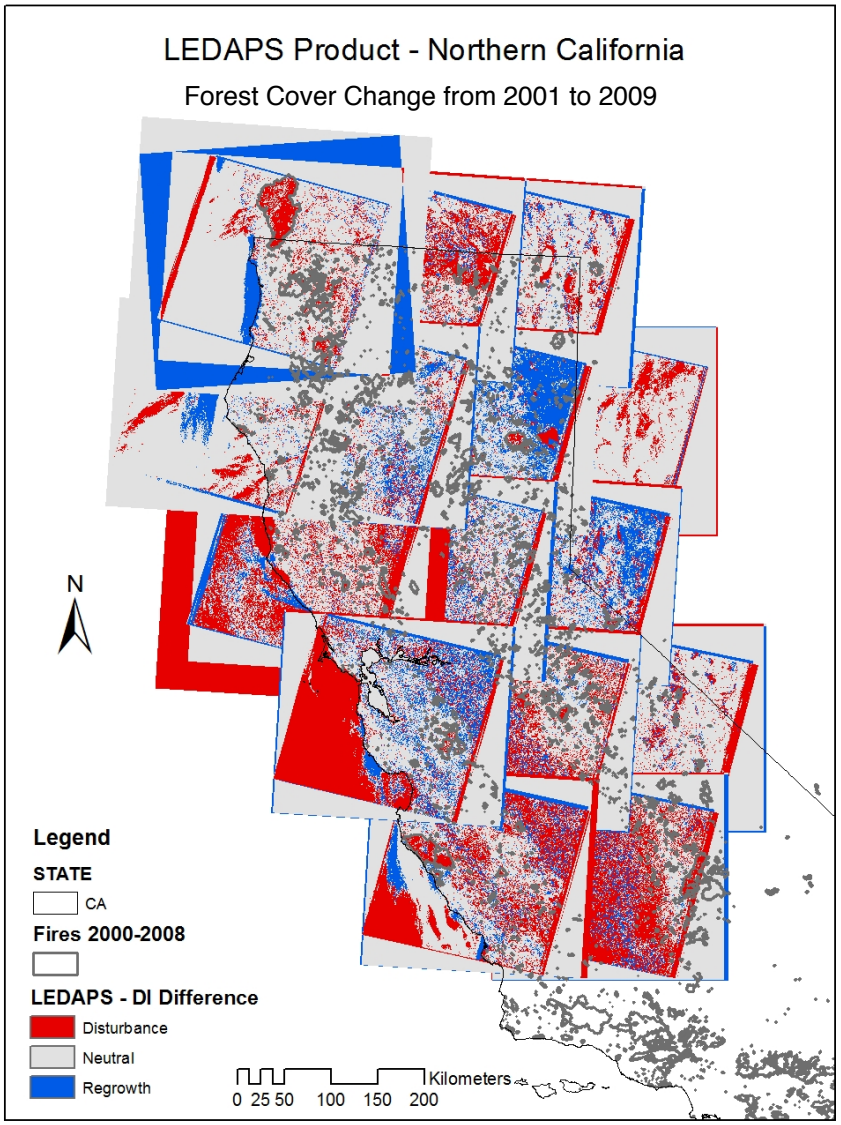
Ames Research Center



LEDAPS Disturbance Index (DI) is the normalized spectral distance of any given pixel from a nominal "mature forest" class to a "bare soil" class. Calculated using the Kauth-Thomas tasseled cap (brightness-greenness-wetness) indices

$$DI = G^* - (B^* - W^*)$$

where B*, G*, and W* represent brightness, greenness, and wetness indices normalized by the statistics of a mature forest class



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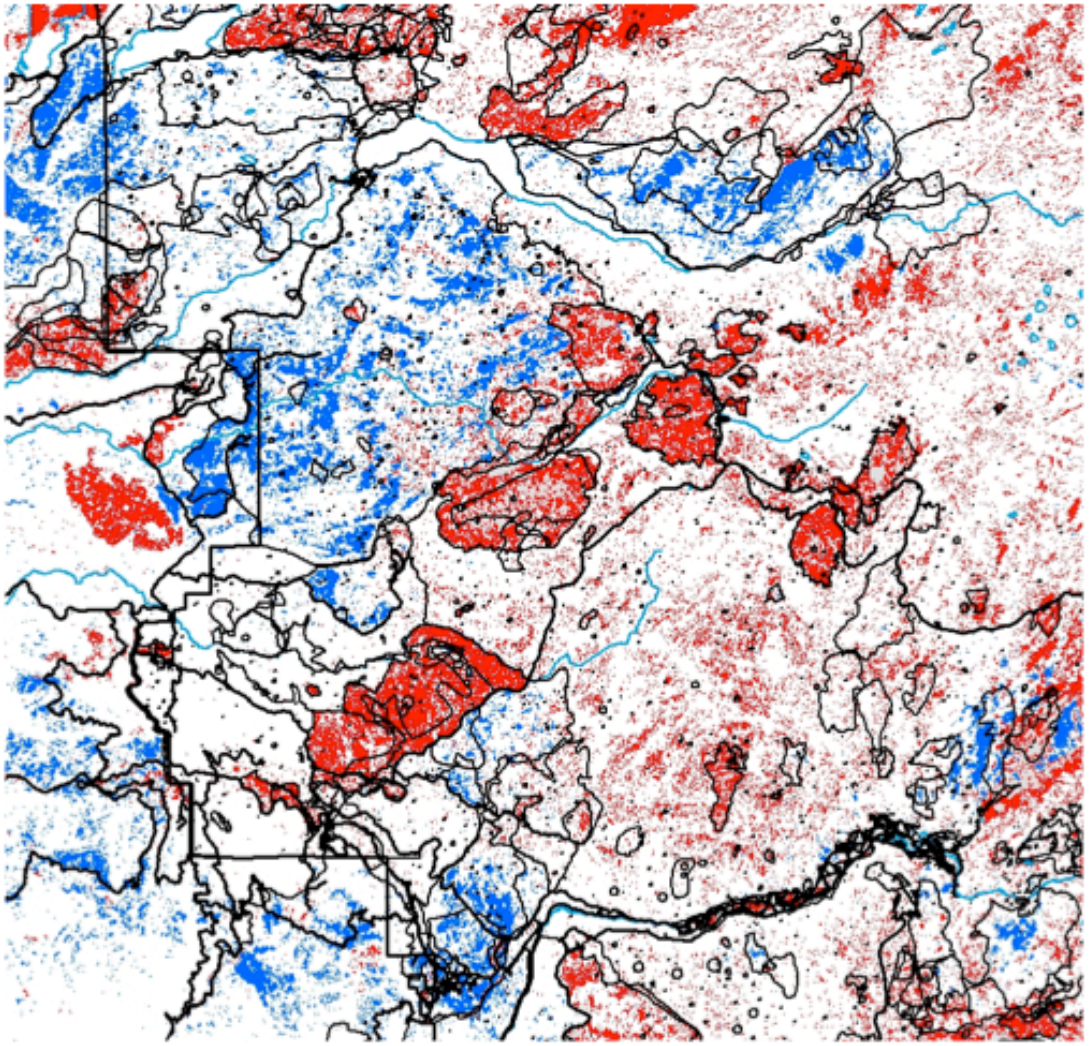
Vegetation Recovery from Disturbance

NPS Partnership

LEDAPS Yosemite National Park 1999 to 2009



Wildfire (date)

A. A-Rock (1990)
B. Panarama (1991)
C. Ackerson (1996)
D. Rancheria (1999)
E. Dark/Falcon (1999)
F. Gin Flat (2002)
G. Wolf (2002)
H. Toulumne (2003)
I. Whiskey (2003)
J. Hetchy (2004)
K. Boundary (2006)
L. Frog (2006)
M. Harden (2009)

Garcia River Forest

Wireless Remote Sensor Web

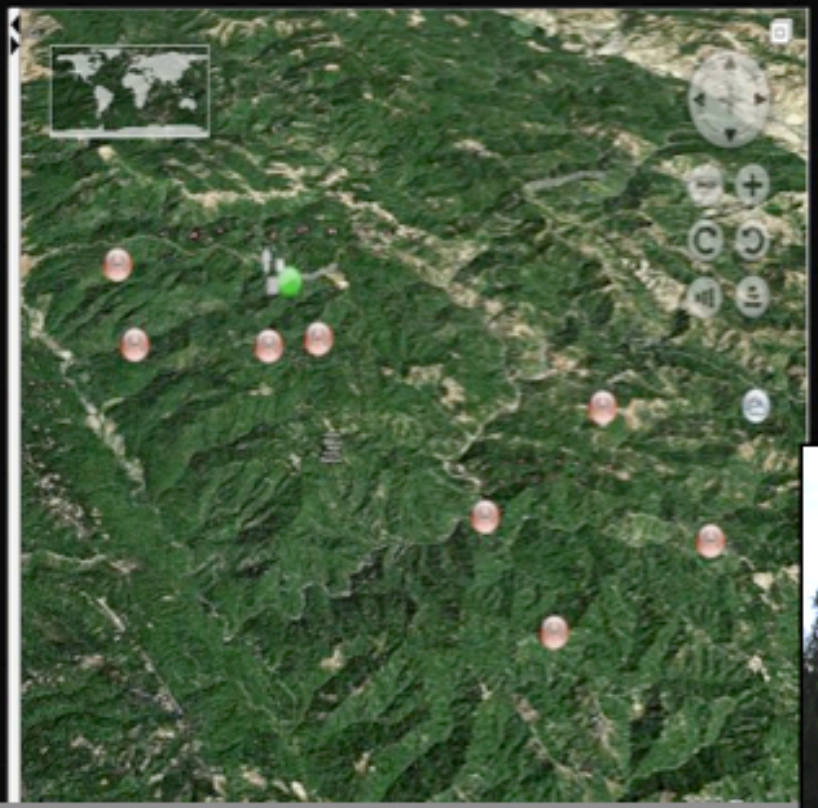
PlanetarySkin Portal

Layers Forums About Getting Started Intelesense

Recent Forum Posts

Forum	Topic	Active
General Discussion	Welcome to the Forum	*1 year 19 weeks* ago

Portal Users Online



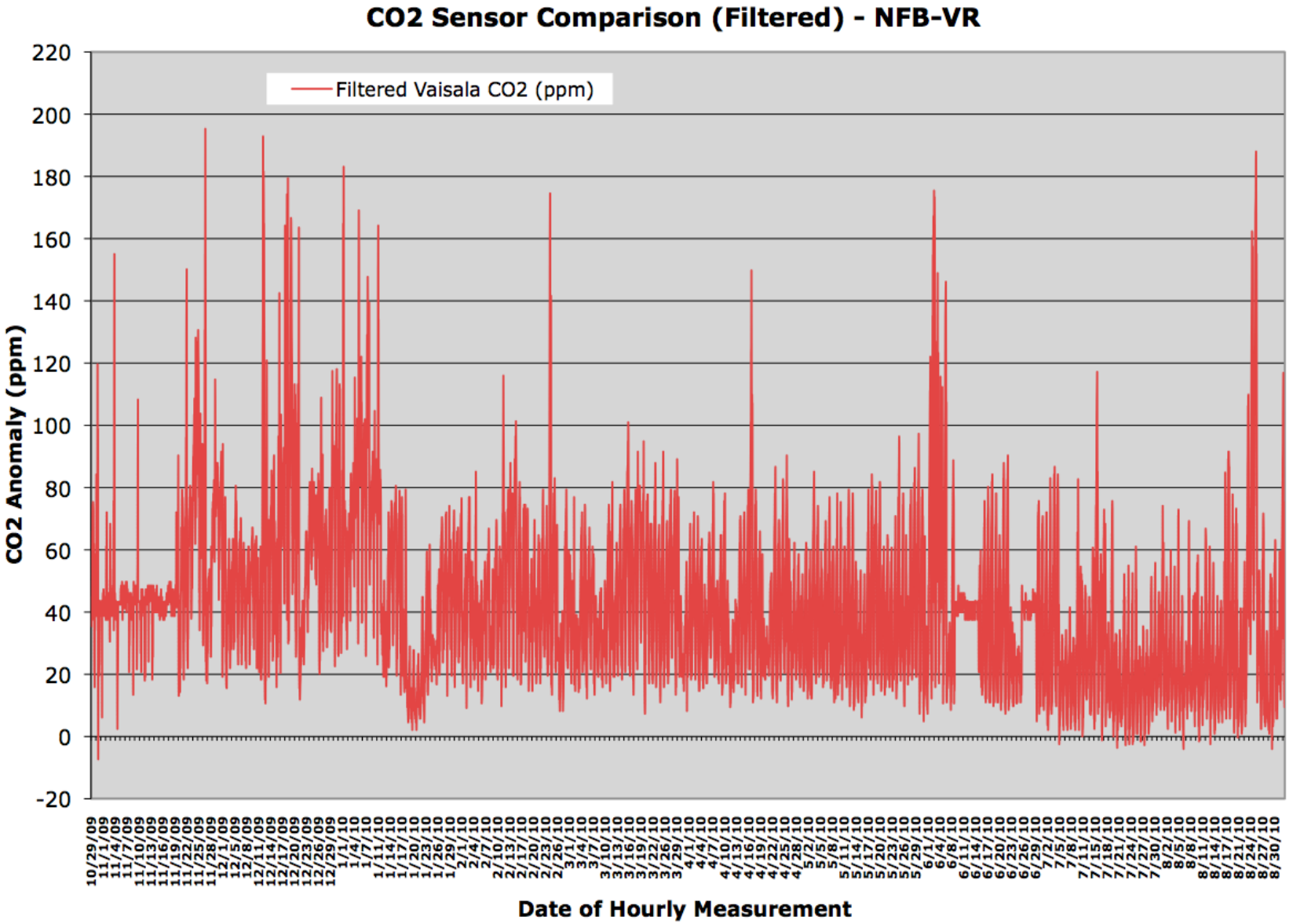
InteleCells

Garcia - NW Switchback
Reported: 52 min 44 sec

Garcia - Vulture's Roost
Reported: 53 min 3 sec

Garcia - Mill Site D
Reported: 53 min 19 sec

Garcia - Jack's Opening
Reported: 53 min 23 sec


CO2 Sensor Comparison (Filtered) - NFB-VR
Filtered Vaisala CO2 (ppm)
CO2 Anomaly (ppm)
220
200
180
160
140
120
100
80
60
40
20
0
-20
10/29/09
11/1/09
11/4/09
11/7/09
11/10/09
11/13/09
11/16/09
11/19/09
11/22/09
11/25/09
11/28/09
12/1/09
12/5/09
12/8/09
12/11/09
12/14/09
12/17/09
12/20/09
12/23/09
12/26/09
12/29/09
1/1/10
1/4/10
1/7/10
1/11/10
1/14/10
1/17/10
1/20/10
1/23/10
1/26/10
1/29/10
2/1/10
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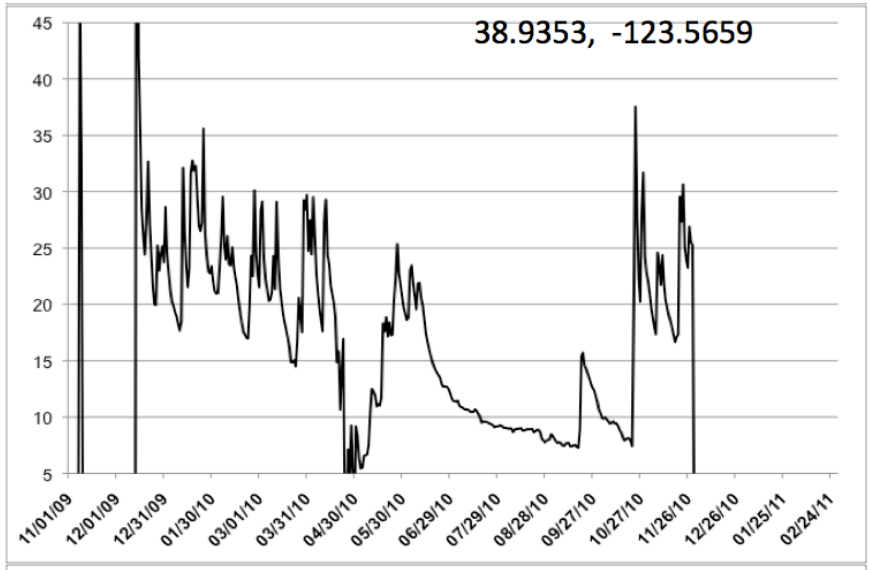
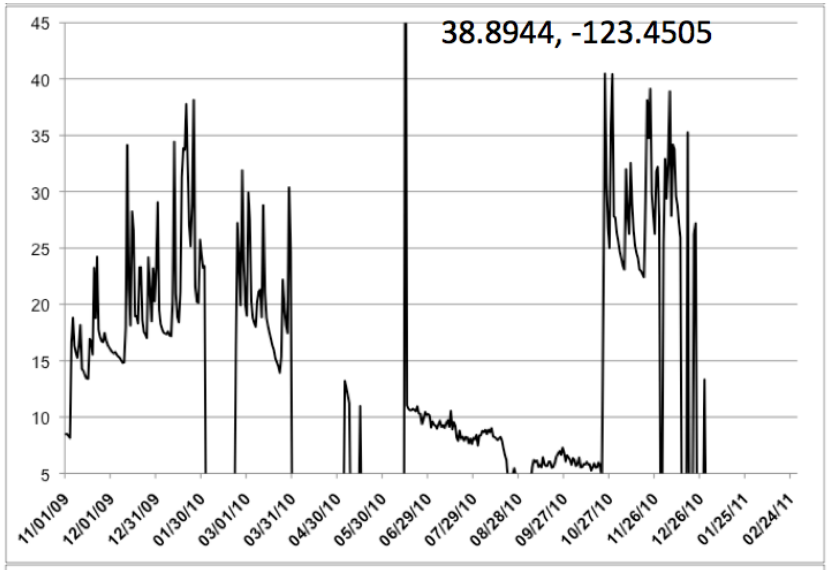
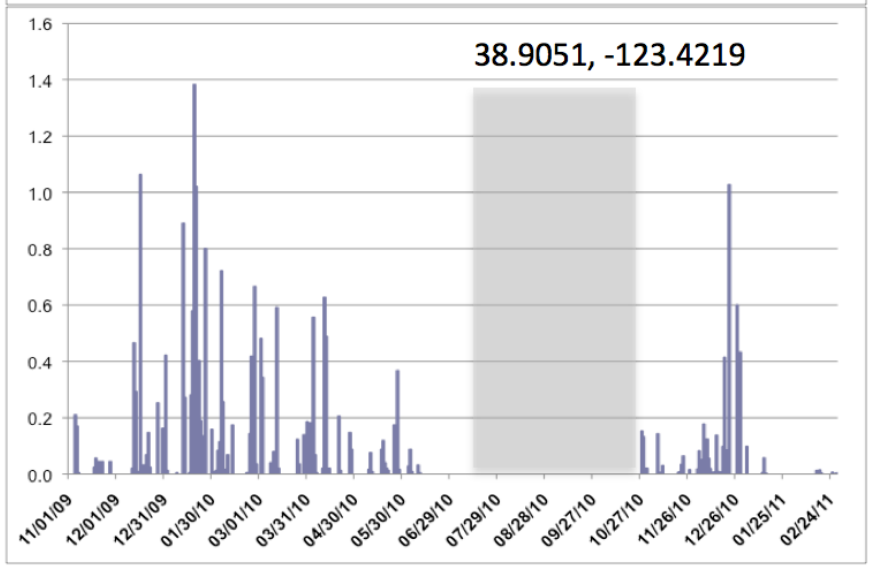
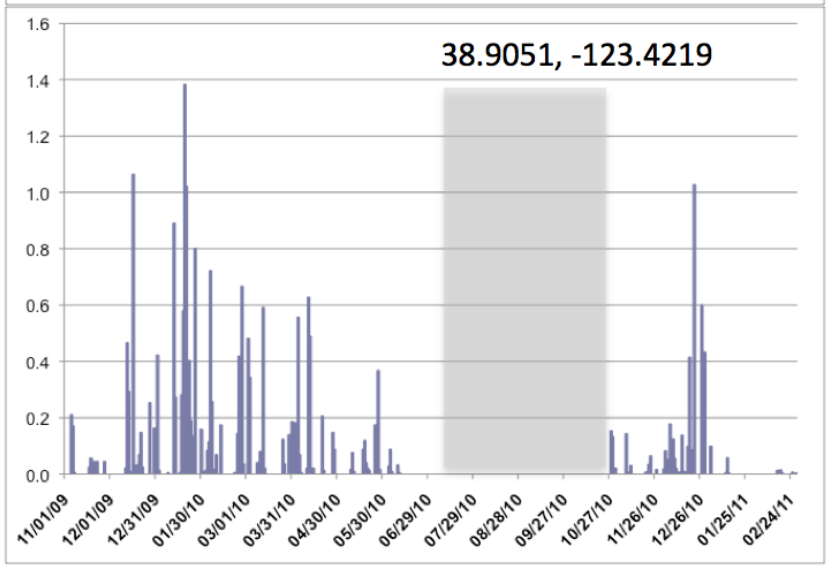
8/30/10
Date of Hourly Measurement

Soil Moisture and Rainfall Relations









Summary and Discussion

- Radar (12 m) and Landsat (30 m) remote sensing applications for forest and woodland habitats are available for immediate implementation across all of California.

- Wood biomass pools and regrowth from disturbance are the primary products from these NASA remote sensing applications.

- Coastal fog mapping has been validated using NASA MODIS daily satellite imagery.

- Wireless sensor networks have been tested in forest watersheds for monitoring microclimate and surface water flows.

- Sustained funding support for any of these applications at Ames Research Center is not presently provided by any Federal Govt. agency.